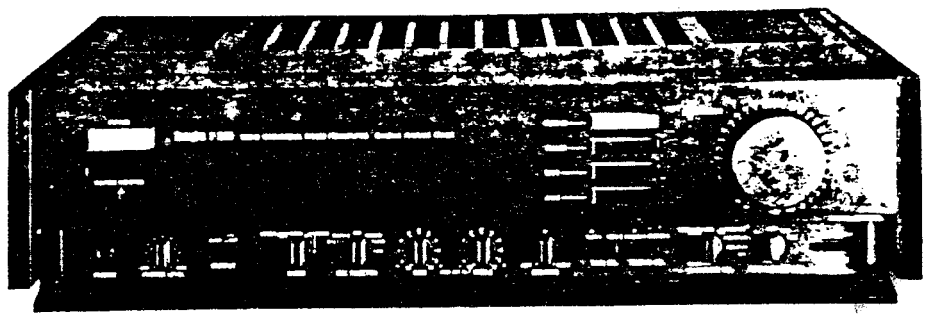
ONKYO® SERVICE MANUAL

SUPER SERVO
STEREO PREAMPLIFIER
MODEL P-3090



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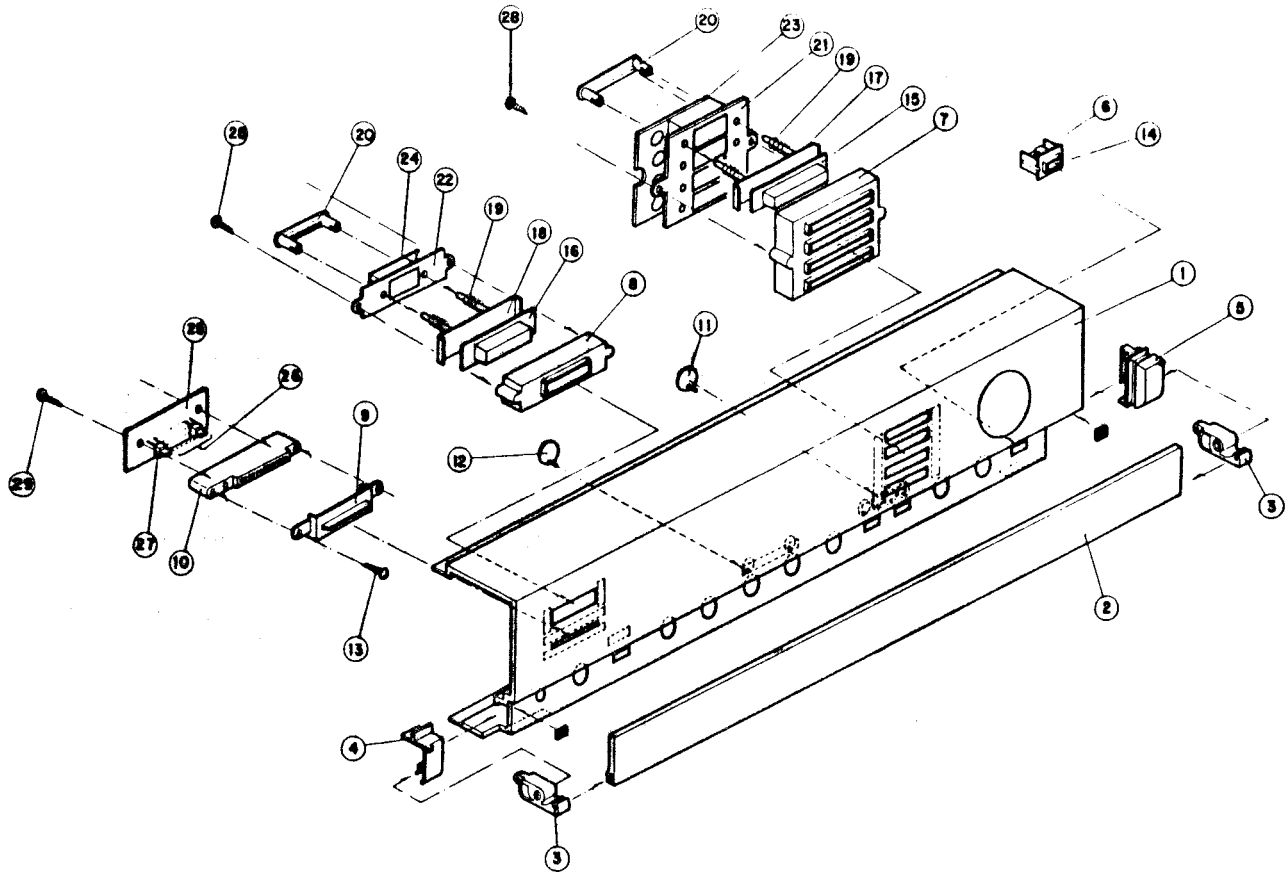
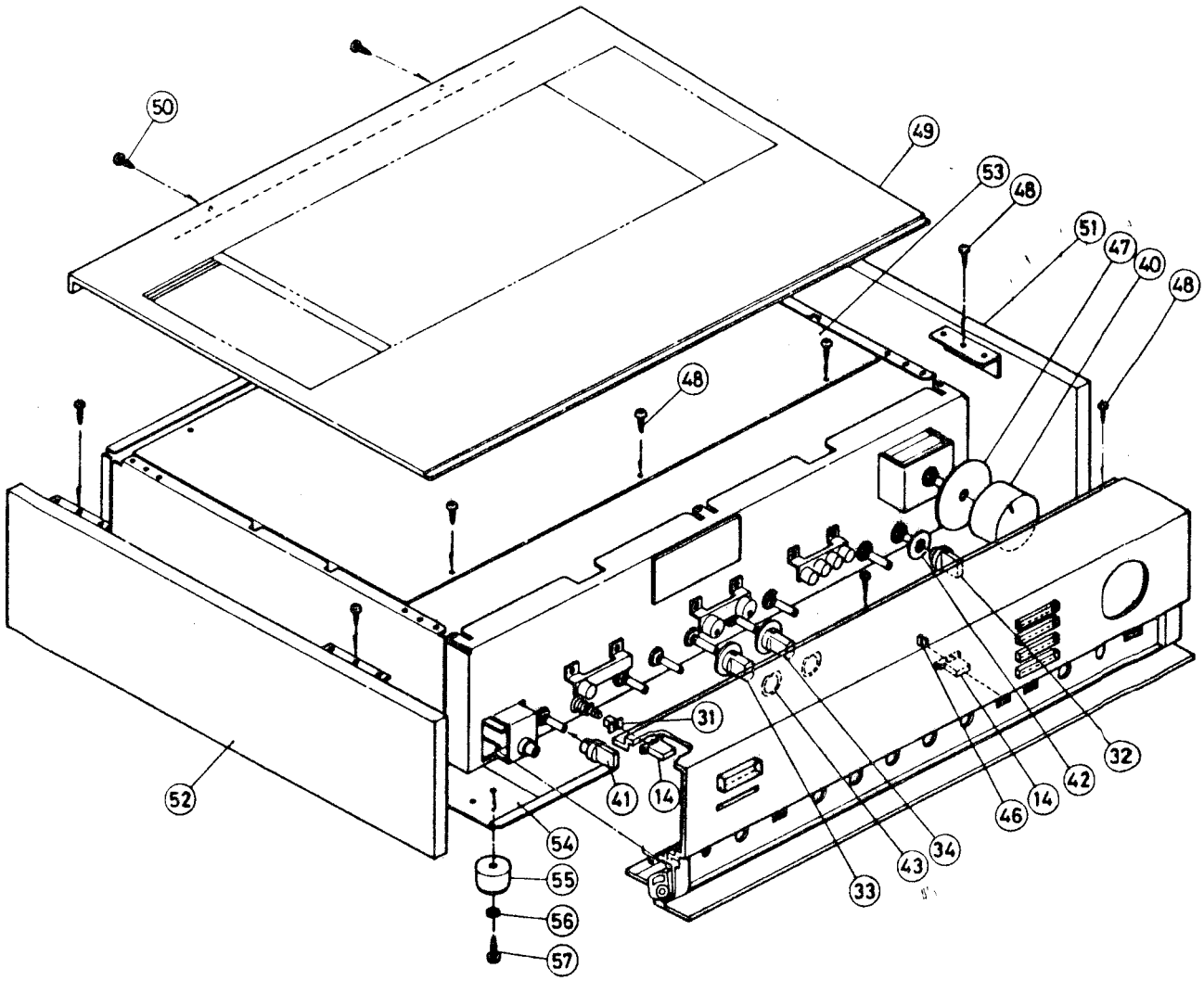
ONKYO
AUDIO COMPONENTS

EXPLODED VIEW



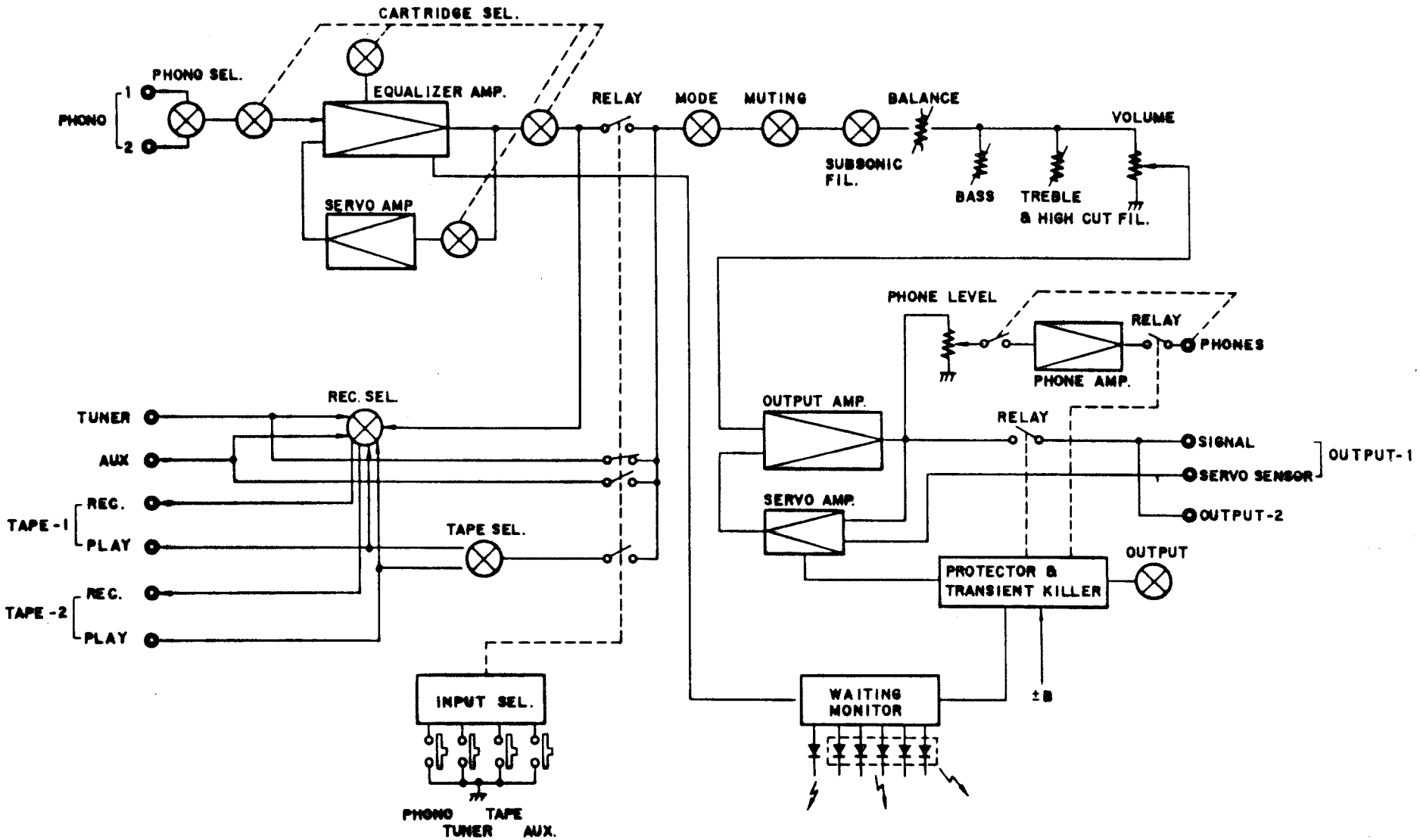
REF. NO.	PARTS NO.	DESCRIPTION
1	12488121	Front panel ass'y
	(Include 2 to 12, 21, 22 and 26)	
2	27210332	Front panel S
3	27300400A	Bearing L
3	27300399A	Bearing R
4	28125082	End cap L
5	28125083	End cap R
6	27267083	Guide, push
7	27267081	Guide, selector
8	27267080	Guide, power
9	27190090	Holder, LED
10	27267082	Guide, LED
11	28198546	Facet A
12	28198537	Facet B
13,28	834130102	3STS+10BQ, Tapping screw
14	28320479	Knob, push
15	28320474	Knob, selector
16	28320473	Knob, power
17	27220015A	Slider, selector
18	27220014A	Slider, power
19	27180049	Spring G
20	27220016	Slider B
21	27190089	Holder, selector
22	27190088	Holder, power
23	12791578	NAPL-978, Lamp pc board ass'y
24	12791580	NAPL-980, Lamp pc board ass'y
25	12791579	NADIS-979, Display pc board ass'y
26	225063	LED
29	831130082	3STS+ 8BQ, Tapping screw



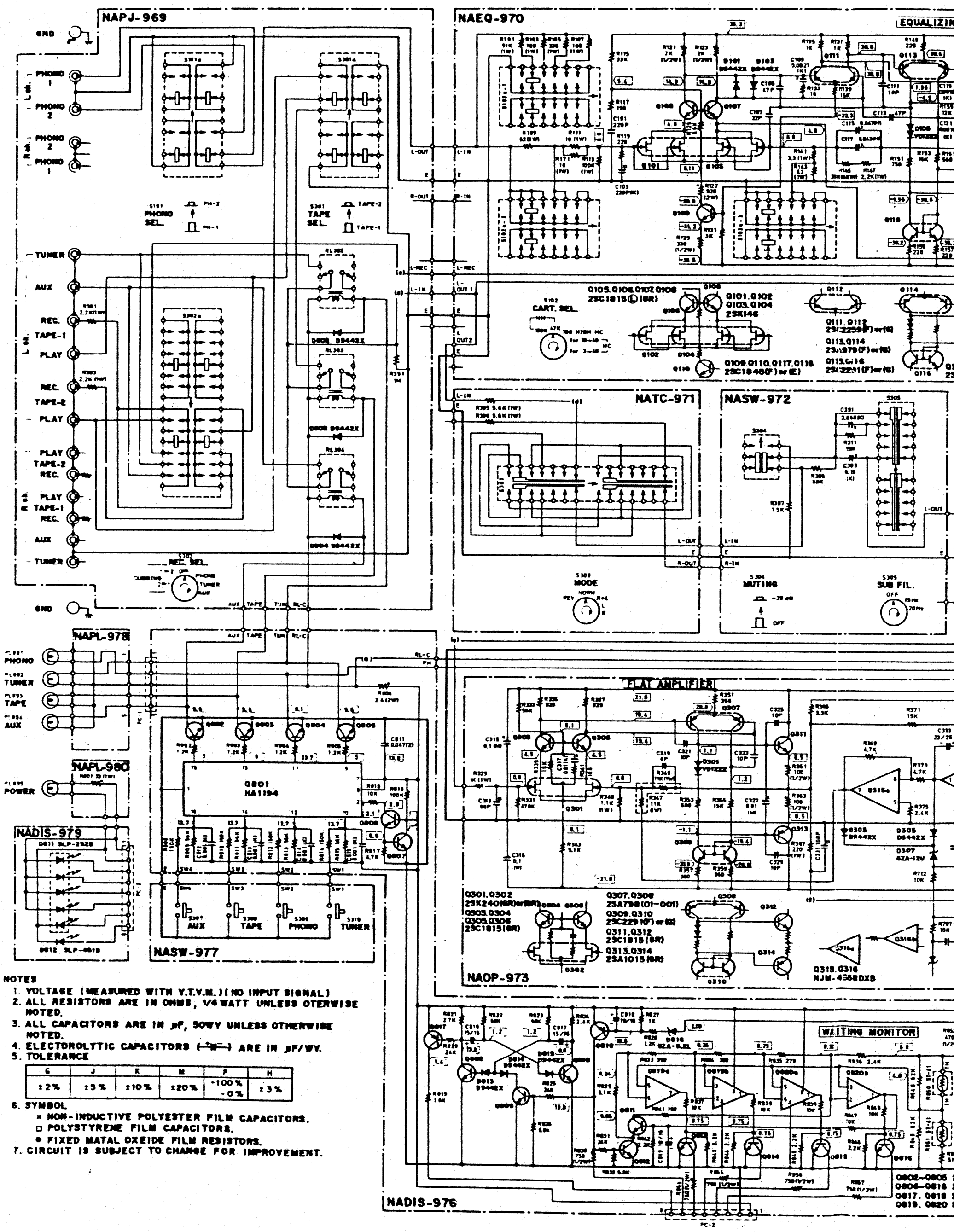
REF. NO.	PARTS NO.	DESCRIPTION
14	28320479	Knob, push
31	27190091	Holder, push
32	28320475	Knob, balance
33	28320475	Knob, bass
34	28320478	Knob, treble
40	28320505	Knob, volume
41	28320476	Knob, headphone
42	28140312	Cushion
43	28140206	Cushion
46	27180049	Spring G
47	28140316	Cushion

REF. NO.	PARTS NO.	DESCRIPTION
48	834430062	3STS+6BQ(BC), Tapping screw
49	28184097	Top cover
50	831430082	3STW+8BQ(BC), Tapping screw
51	12488902	Side panel R
52	12488901	Side panel L
53	27150124	Shilded plate
54	27170091	Bottom board
55	27175020	Leg
56	87613008	W3*8F, Spring washer
57	834130202	3STS+20BQ, Tapping screw

BLOCK DIAGRAM



SCHEMATIC DIAGRAM



NOTES

1. VOLTAGE (MEASURED WITH V.T.V.M.)(NO INPUT SIGNAL)
2. ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTERWISE NOTED.
3. ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
4. ELECTOROLYTIC CAPACITORS (+ —) ARE IN μF/WV.
5. TOLERANCE

G	J	K	M	P	H
±2%	±5%	±10%	±20%	+100% -0%	±3%

6. SYMBOL
   - × NON-INDUCTIVE POLYESTER FILM CAPACITORS.
   - □ POLYSTYRENE FILM CAPACITORS.
   - ● FIXED MATAL OXEIDE FILM RESISTORS.
7. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

EQUALIZING AMPLIFIER

Q111, Q112
2SK229(F) or (G)
Q113, Q114
2SA979(F) or (G)
Q115, Q116
2SK22?1(F) or (G)

Q121, Q122
2SD526(Y)
Q123, Q124
2SB596(Y)
Q119, Q120
2SA992(F) or (E)

Q201, Q202
2SA995(F) or (G)
Q203, Q204, Q205, Q206
2SC1815(GR)
Q207, Q208
NJM-4558DX

Q901, Q902 2SC1815(Y) or (GR)
Q903, Q904 2SA1015(Y) or (GR)
Q905 2SD880(O) or (Y)
Q906 2SB834(O) or (Y)
Q907, Q909 2SC1845(F) or (E)
Q908, Q910 2SA992(F) or (E)
Q911, Q912 2SK246(GR)

NATC-971

VOLUME

BALANCE

TREBLE DEFEAT

BASS DEFEAT

SUB FIL. OFF 15Hz 20Hz

Q401 LA4170

HEAD PHONE AMPLIFIER

PHONES

NAHP-975

Q315, Q316
NJM-4558DXB

Q913
2SC1627(Y)
Q914
2SA1077(Y)

Q915, Q916
2SK246(GR)

Q917, Q918
RN-01

UD TYPE

POWER

AC 120V 60Hz

UG TYPE

AC 220V 50Hz

WAITING MONITOR

Q802~Q805 2SC2001(K) or (L)
Q806~Q816 2SC1815(GR)
Q817, Q818 2SA1015(GR)
Q819, Q820 NJM-4558D

NAWT-981

PRE OUT BASS TREBLE TAPE-1 TAPE-2 PH-1 PH-2

Q701
2SA1015(GR)
Q702, Q703
2SC1815(GR)
Q704
2SC2001(K) or (L)

SIGNAL
SERVO SENSOR
OUT-1
OUT-2

NAPJ-974

ONKYO CORPORATION

PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
A1	27110118	Front bracket
A2	27190063	Holder
A3	27140426	Bracket, headphone
A4	27140428	Bracket, volume
A5	27140429A	Bracket, lamp A
A6	27140430A	Bracket, lamp B
A7	28330037	Cap
A13	27115076	Side panel L
A14	27115077	Side panel R
A15	27130227	Bracket
A16	27130228	Bracket
A17	27130229	Bracket
A18	27130230	Bracket
A19	27140431	Bracket L, pcb
A20	27140432	Bracket R, pcb
A27	28140315	Cushion
A28	27150124	Shielded plate
A31	27300347	Damper
A37	27260041	Shaft
A41	27120354A	Back panel (D)
	27120355	Back panel (G)
A42	27190063	Holder
A47	270280	SR-4K-4, Strainrelief
A51	27300168	Terminal, speaker
A351	12488121	Front panel ass'y
A352	27210332	Front panel S
A353	27300399A	Bearing R
A354	27300400A	Bearing L
A355	28125082	End cap L
A356	28125083	End cap R
A357	28140206	Cushion
A358	28140312	Cushion
A359	27267080	Guide, power
A360	27267081	Guide, selector
A361	27267083	Guide, push
A362	27190090	Holder, LED
A363	27190091	Holder, push
A364	27220014A	Slider, power
A365	27220015A	Slider, selector
A366	27220016	Slider B
A367	28198537	Facet B
A368	27180049	Spring G
A369	28140314	Cushion
A370	28140296	Cushion
A371	28198546	Facet A
A373	28140316	Cushion
A376	27180037	Spring
A381	28184097A	Top cover
A382	27270059	Spacer
A383	28140204	Cushion
A601	27170091A	Bottom board
A602	27175020	Leg
A801	28320505	Knob, volume
A802	28320473	Knob, power

REF. NO.	PARTS NO.	DESCRIPTION
A803	28320474	Knob, selector
A804	28320475	Knob, balance
A805	28320476	Knob, headphone
A806	28320477	Knob, bass
A807	28320478	Knob, treble
A808	28320479	Knob, push
C001, C002	3500065A	0.01uF, AC400V/125V, Capacitor IS
	27300080	Cover, capacitor
F001	252044	2A(ST-6), Fuse (D)
	250100A	Fuseholder (D)
F001	252070	1A-SE-EAK, Fuse (G)
	25065096	Fuseholder (G)
R001	5104111	N40DG100KT30M, Variable resistor
S001	25035290	NPS-111-L256P, Power switch (D)
	25035289	NPS-111-L255P, Power switch (G)
S101c S301c	25035227	NPS-122-L191, Remote switch, operation section
S101b S301b	25065112	Remote switch, wire section
S102c	25030177	NRSM-105-20ZV, Remote switch, operation section
S102b	25065143	Remote switch, wire section
S302c	25030178	NRSM-106-25ZV, Remote switch, operation section
S302b	25065144	Remote switch, wire section
S306	25035108	NPS-122-L73, Push switch
T001	230557	NPT-721D, Power transformer (D)
	230558	NPT-721G, Power transformer (G)
U1	12791569	NAPJ-969, Source input and rec. output terminal pcb ass'y
U2	12791570	NAEQ-970, Equalizer ampli. pcb ass'y
U3	12791571	NATC-971, Tone control circuit pcb ass'y
U4	12791572	NASW-972, Muting/sub sonic filter switch pcb ass'y
U5	12791573	NAOP-973, Flat amplifier pcb ass'y
U6	12791574	NAPJ-974, Output terminal pcb ass'y
U7	12791575	NAHP-975, Headphone amplifer pcb ass'y
U8	12791576	NADIS-976, Waiting monitor pcb ass'y
U9	12791577	NASW-977, Input selector pcb ass'y

REF. NO.	PARTS NO.	DESCRIPTION
U10	12791578	NAPL-978, Source selector pcb ass'y
U11	12791579	NADIS-979, Waiting lamp pcb ass'y
U12	12791580	NAPL-980, Power lamp pcb ass'y
U13	12791581	NAWT-981, Indicator lamp terminal pcb ass'y
	25050073	NSCT-4P21, AC outlet (D)
	253100	AS-UC-4, Power supply cable (D)
	253083	AS-CEE, Power supply cable (G)
	250153	P0107, Shorted plug
	2000156	NSAS-5P039, Socket
	2000157	NSAS-8P040, Socket
	25108005	Terminal (G)

Note:(D);Only 120V model
(G);Only 220V model

PACKING MATERIALS-PARTS LIST

PARTS NO.	DESCRIPTION
29050506	Master carton box
29090648	Pad
29095016-1	1,000*670mm, Protection sheet
29100038	950*720mm, Poly-vinyl bag
29095165	Sheet F
29090591	Pad F
29340565	Instruction manual
29100006	250*350mm, Poly-vinyl bag
2010068	Connection cable
29365006-3	Warranty card (D)
293600363	Caution label C (D)
29380079	Cabinet composite tag (D)
29358002	Service station list (D)
282969	Caution label A (D)
29365005-3	Warranty card (G)

Note: (D);Only U.S.A model
(G);Only West Germany model

PC BOARD PARTS LIST

SOURCE INPUT AND RECORDING OUTPUT TERMINAL(NAPJ-969)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D802-D804	223133	DS442K
	Resistors	
R301-R304	441622224	2.2kΩ, 1W, Metal oxide film
	Switches	
S101a,S301a	25065111	NSS-4257, Phono/Tape
S302a	25065079	NSS-4643, Rec.
	Relaies	
RL302-RL304	25065145	NRL-2PO.3ADC9-01
	Terminals	
	25045065	NPJ-4PDBL32

EQUALIZER AMPLIFIER (NAEQ-970)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q101-Q104	2211530	2SK146, F.E.T
Q105-Q108	2211895	2SC1815(L)(GR)
Q109,Q110	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q111,Q112	2211371 or	2SC2259(O-001) or
	2211372	2SC2259(O-002)
Q113,Q114	2211585 or	2SA979(F) or
	2211586	2SA979(G)
Q115,Q116	2211445 or	2SC2291(F) or
	2211446	2SC2291(G)
Q117,Q118	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q119,Q120	2211792 or	2SA992(F) or
	2211793	2SA992(E)
Q121,Q122	2200744	2SD526(Y)
Q123,Q124	2200413	2SB596(Y)
Q201,Q202	2211515 or	2SA995(F) or
	2211516	2SA995(G)
Q203-Q206	2211895	2SC1815(L)(GR)
Q901,Q902	2211254 or	2SC1815(Y) or
	2211255	2SC1815(GR)
Q903,Q904	2211454 or	2SA1015(Y) or
	2211455	2SA1015(GR)
Q905	2201073 or	2SD880(O) or
	2201074	2SD880(Y)
Q906	2201243 or	2SB834(O) or
	2201244	2SB834(Y)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q907,Q909	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q908,Q910	2211792 or	2SA992(F) or
	2211793	2SA992(E)
Q911,Q912	2211945	2SK246(GR), F.E.T.
	ICs	
Q207,Q208	222502	NJM-4558DX
	Diodes	
D101-D104	223133	DS442K
D105,D106	4000068	VD1232
D201-D204	223133	DS442K
D801	223133	DS442K
D901-D904	224123	GZA22-L
D905,D906	223848	GP08B
D907,D908	224097	GZA6.2-L
	Capacitors	
C205,C206	352752219	220μF, 25V, Elect.
C207,C208	352752219	220μF, 25V, Elect.
C901-C904	352780109	1μF, 50V, Elect.
C905-C908	352751019	100μF, 25V, Elect.
C909,C910	391083317	330μF, 50V, LL
C911,C912	352780229	2.2μF, 50V, Elect.
C913,C914	352741019	100μF, 16V, Elect.
	Metal oxide film resistors	
R101,R102	441629134	91kΩ, 1W
R103,R104	441621014	100Ω, 1W
R105,R106	441623314	330Ω, 1W
R107,R108	441621014	100Ω, 1W
R111,R112	441621004	10Ω, 1W
R113,R114	441621044	100kΩ, 1W
R121-R124	441522024KF	2kΩ, 1/2W
R217,R128	441728214KF	820Ω, 2W
R129,R130	441523314	330Ω, 1/2W
R141,R142	441620334	3.3kΩ, 1W
R145,R146	441623333	33kΩ, 1W
R147,R148	441622224	2.2kΩ, 1W
R165,R166	441623924	3.9kΩ, 1W
R167-R170	441520334KF	3.3Ω, 1/2W
R171,R172	441621004	10Ω, 1W
R207-R210	441523924	3.9kΩ, 1/2W
R213,R124	441622013	200Ω, 1W
R215,R216	441621004	10Ω, 1W
R237,R238	441521824	1.8kΩ, 1/2W
R901-R904	441521024KF	1kΩ, 1/2W

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Metal oxide film resistors	
R905-R908	4415236245KF	3.6kΩ,1/2W
	Resistors	
R231,R232	5225070	N10HR2.2KBDM, Semi-fixed
R850	4000074	5T-4(ONK), Thermistor
	Switch	
S102a	25065101	NSS-10652, Cartridge
	Relay	
RL301	25065145	NRL-2PO.3ADC9-01
	Case	
	27300152	
	Film	
	223018	AC316, Transistor
	223019	AC229, Transistor

TONE CONTROL CIRCUIT (NATC-971)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Resistors	
R305,R306	4416256245	5.6kΩ, 1W, Metal oxide film
R313	5104110	N27DGLC250KMN25M, Balance
R315	5104108	N27DQL11C110K180K25M Bass control
R319	5104109	N27DGL11C219K25M, Treble control
	Switch	
S303	25030175	NRSM-145-25ZV, Mode

MUTING/SUBSONIC FILTER CIRCUIT (NATC-972)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Switches	
S304	25035092	NPS-122-L57, Muting
S305	25030176	NRSM-143-25ZV, Subsonic

FLAT AMPLIFIER CIRCUIT (NAOP-973)-PARTS LIST

	Transistors	
Q301,Q302	2211915 or 2211916	2SK240(GR) or 2SK240(BL), F.E.T
Q303-Q306	2211255	2SC1815(GR)
Q307,Q308	2211140	2SA798(0-001)
Q309,Q310	2211445 or 2211446	2SC2291(F) or 2SC2291(G)
Q311,Q312	2211255	2SC1815(GR)
Q313,Q314	2211455	2SA1015(GR)
Q701	2211455	2SA1015(GR)
Q702,Q703	2211255	2SC1815(GR)
Q704	2211771 or 2211772	2SC2001(K) or 2SC2001(L)
Q913	2211414	2SC1627(Y)
Q914	2211424	2SA817(Y)
Q915,Q916	2211945	2SK246(GR)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q315,Q316	222585	NJM-4558DXB
	Diodes	
D301,D302	4000068	VD1222
D303-D306	223133	DS442X
D307,D308	224112	GZA12-U
D701,D703	223133	DS442X
D705,D706	223133	DS442X
D913,D914	224123	GZA22-L
D915	223867	WL02
D916	223862	WL01
D917	223867	WL01
	Capacitors	
C333-C336	352752209	22μF, 25V, Elect.
C701	3527L4709	47μF, 16V, Elect.
C702	352734709	47μF, 6.3V, Elect.
C923-C926	352751019	100μF, 25V, Elect.
C927,C928	3504150	3,300μF, 63V, Elect.
C929,C930	352764719	470μF, 35V, Elect.
C931,C932	3527L2229	2,200μF, 16V, Elect.
C933-C935	384171037	0.01μF, 630V, DT
	Metal oxide film resistors	
R329,R330	4416210245	1kΩ, 1W
R345,R346	4416211245	1.1kΩ, 1W
R347-R350	4416211345	11kΩ, 1W
R361-R364	4415210145KF	100Ω, 1/2W,
R367,R368	4416222145	220Ω, 1W
R711	4415212045KF	12Ω, 1/2W
R923,R924	4415233045KF	33Ω, 1/2W
	Relay	
RL701	25065139	NRL-2PO.3ADC12-05
	Casies	
	27300342	A
	27300343	B
	27300152	

OUTPUT TERMINAL (NAPJ-974)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	25045065	NPJ-4PDBL32, Terminal
	25045080	NPJ-2PDBL40, Terminal

HEADPHONE AMPLIFIER (NAHP-975)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
C401	222543	LA4170, IC
D401	223848	GP08B, Diode
D402	223133	DS442X, Diode
C401,C402	352731009T	10μF, 10V, Elect. capacitor
C403,C404	391050477T	4.7μF, 25V, LL capacitor
C407,C408	391031017T	100μF, 10V, LL capacitor
C411	3504156	1,000μF, 16V, Elect. capacitor
R401	5148055	N16RGM100KB25M, Headphone level variable resistor

CIRCUIT NO.	PARTS NO.	DESCRIPTION
RL05,RL06	RN1523904	39Ω, 1/2W, Metal oxide film resistor
RL07	RN152100KKF	10Ω, 1/2W, Metal oxide film resistor
RLY01	25065139	NRL-2P0.3ADC12-05, Relay
	25045079	M-1658-MA, Stereo headphone jack

WAITING MONITOR INDICATOR CIRCUIT (NADIS-976)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q801	222567	HA1194
Q819,Q820	222465	NJM-4558D
	Transistors	
Q802-Q805	2211771 or 2211772	2SC2001(K) or 2SC2001(L)
Q806-Q816	2211255	2SC1815(GR)
Q817,Q818	2211455	2SA1015(GR)
	Diodes	
D813-D815	223133	DS442X
D816,D817	224097	GZA6.2-L
	Capacitors	
C816,C817	352741509	15μF, 16V, Elect.
C818,C819	352741009	10μF, 16V, Elect.
R806	RN1722402KF	2kΩ, 2W, Metal oxide film
R830	RN152751KKF	750Ω, 1/2W, Metal oxide film
R851	400007	5T-41(ONK), Themistor
R852	RN152471KKF	470Ω, 1/2W, Metal oxide film
R854-R857	RN152751KKF	750Ω, 1/2W, Metal oxide film
	Plugs	
	25065055	NPLG-5P11
	25065070	NPLG-8P15

INPUT SELECTOR (NASW-997)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S307-S310	25035156	NPS-111-S120, Aux/Tape/phono/Tuner selector switch

SOURCE SELECTOR LAMP (NAPL-978)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL801-PL804	210065B	PL12V150mA, Lamp
	2000156	NSAS-5P039, Socket
	27190089	Holder, selector

WAITING MONITOR LAMP (NAPL-979)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D811	225063	SLP-252B, L.E.D.
D812	225064	SLP-451B, L.E.D.
	2000157	NSAS-8P040, Socket
	27267082	Guide

POWER LAMP (NAPL-980)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL805	210065B	PL12V, 150mA, Lamp
R801	RN1623304	33Ω, 1W, Metal oxide film
	27190088	Holder, power

INDICATOR LAMP TERMINAL (NAWT-981)-PARTS LIST

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Lamps	
PL806-PL808	210086	PL14V60mAW-0.9
PL809-PL812	2110085	PL14V60mAW-2.6
	Resistors	
R858	RN152101KKF	100Ω, 1/2W, Metal oxide film
R859,R860	RN152680KKF	68Ω, 1/2W, Metal oxide film
R861,R862	RN152820KKF	82Ω, 1/2W, Metal oxide film

ADJUSTMENT PROCEDURES

*Preparations

Place the unit on a level surface and leave the power on for ten minutes or more, making sure the ventilation openings are not blocked.
Then perform the following adjustment.

*Center voltage of equalizer amplifier
Connect a high sensitivity DC voltmeter to the TAPE-REC terminals.
(The REC SELECTOR should be in PHONO position.)
Adjust the semi-fixed resistor r2j1 (R232) so that the voltmeter reading is 0±200μV.